Pollinator Planting, Carter County, Montana

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Objective: Test species for pollinator planting use in the region
County: Carter, MT
Average Annual Precipitation: 13 - 14 inches
MLRA: 58AE, Sedimentary Plains
Dominant Soil Type: Archin loam and Creed-Gerdrum complex
Elevation: 3344 ft
Site Preparation: Glyphosate application, disk and harrow
Planting Date: November 2017
Planting Method: Drill seeded (plot drill) at 14 inch row spacing
Previous Site History: Range and pasture land
Herbicide: Two years of glyphosate (Roundup) application prior to seeding
Irrigation: None
Grazing: Wildlife only
Monitoring Dates: Aug 2018 and June 2019

Fig. 1. Drill seeding into a well-prepared seedbed.

Common Name	Scientific Name	Cultivar	Origin	Bloom Period[1]	lbs PLS/acre
Alfalfa	*Medicago sativa*	Ladak	Introduced	E, M, L	5.0
Cicer milkvetch	*Astragalus cicer*	Lutana	Introduced	E, M, L	7.0
Red clover	*Trifolium pratense*		Introduced	E, M, L	6.0
Sainfoin	*Onobrychis viciifolia*	Delaney	Introduced	E, M, L	34.0
Small burnet	*Sanguisorba minor*	Delar	Introduced	M, L	20.0
Yellow sweetclover	*Melilotus officinalis*		Introduced	E, M, L	4.0
American vetch	*Vicia americana*		Native	E, M	34.0
Blackeyed Susan	*Rudbeckia hirta*		Native	E, M, L	0.8
Blanketflower	*Gaillardia aristata*	Meriwether	Native	M, L	5.0
Firecracker penstemon	*Penstemon eatonii*		Native	E, M	3.0
Lewis flax	*Linum lewisii*	Appar	Native	E, M	4.0
Maximillian sunflower	*Helianthus maximilianii*	Medicine Creek	Native	M, L	5.0
New England aster	*Symphyotrichum novae-angliae*		Native	M, L	1.4
Prairie coneflower	*Ratibida columnifera*	Stillwater	Native	E, M, L	2.0
Purple coneflower	*Echinacea angustifolia*		Native	E, M, L	9.0
Purple prairie clover	*Dalea purpurea*	Bismark	Native	E, M, L	7.0
Rocky Mtn. beeplant	*Cleome serrulata*		Native	E, M, L	13.5
Western yarrow	*Achillea millefolium*		Native	E, M, L	0.5
White prairie clover	*Dalea candida*	Antelope	Native	E, M	4.0

[1]Bloom periods: Early (April, May, June), Middle (July, August), and Late (September, October)

Introduction: The purpose of this planting was to establish plots of individual native and introduced pollinator plant species to determine which species establish well alone or in a mix, and determine which species work best for the three bloom periods, especially late summer and fall.
This project tested seeding introduced pollinator species individually and in a mix, and native species individually and in a mix. The landowner provided excellent site preparation. The site was sprayed with Roundup, disked, and harrowed which created a clean, firm seedbed. Plots were dormant seeded in November 2017 prior to above average precipitation in 2018 and spring 2019.

Results:


Pollinator on blue flax.

- Introduced species established better than the native species.
- Red clover, yellow sweetclover, and alfalfa had the highest plant canopy cover two years after seeding. These species had flower buds on 90% of plants and will be an excellent pollinator resource.
- Small burnet and cicer milkvetch had over 1.5 plants per square foot but were small plants with a low canopy cover. Their canopy cover may expand with the growing season and as plants mature.
- Lewis flax and western yarrow were the native species with the highest canopy cover and density.
- All plants are expected to grow more this season.
- Blackeyed Susan, firecracker penstemon, New England aster, purple prairie clover, white prairie clover, and Rocky Mountain beeplant did not establish in June 2019.
- Weeds were present and may have limited the establishment of native species. Weeds were present in introduced species plots but these species were not as inhibited by the weed presence.
- Monitoring will continue to document the bloom period for each species.

Table 2. Species establishment and characteristics two springs following planting.

Common Name	Density (plants/ft^2)	Canopy Cover (%)	Height (inch)	Ability to Spread	Buds, Blooms or Seed Present
Alfalfa	1.8	65	25	Yes	Yes – 90% plants
Cicer milkvetch	1.9	25	7	No	No – small
Red clover	4.1	80	20	Yes	Yes – 90% plants
Sainfoin	0.7	15	22	No	Yes – 50% plants
Small burnet	1.6	45	22	Yes	Yes – 90% plants
Yellow sweetclover	3.1	75	20	Yes	Yes – 90% plants
Introduced MIX	Species that established: alfalfa, sweetclover, small burnet, red clover, and cicer				
American vetch	0.1	5	8	No	No – small
Blanketflower	trace	1	6	No	Yes – 25% plants
Lewis flax	1.3	15	15	Yes	Yes – 50% plants
Maximillian	trace	5	9	No	No – small
Prairie coneflower	trace	1	8	No	No – small
Purple coneflower	trace	3	6	No	No – small
Western yarrow	1.3	20	13	Yes	Yes – 50% plants
Native MIX	Species that established: blue flax and yarrow				


Fig. 2. Rows of small burnet.


Fig. 3. Red clover was a top performer.


Fig. 4. Western yarrow and blue flax (above) were the native species that established the best.